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Heart Failure

MILRINONE PLASMA CONCENTRATIONS ACROSS A SPECTRUM OF RENAL FUNCTION IN STAGE D HEART FAILURE PATIENTS

Poster Contributions
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Background: Milrinone exhibits a sigmoidal relationship between plasma concentrations and the percent increase of cardiac index, with no additional hemodynamic benefit above 500 ng/ml. Milrinone may accumulate in renal dysfunction and increase arrhythmic risk in a concentration dependent manner. We hypothesized that heart failure (HF) patients with renal dysfunction would have elevated steady-state milrinone concentrations.

Methods: 29 patients on continuous milrinone infusion at the time of plasma collection were enrolled in the Vanderbilt Heart Registry. Creatinine clearance (CrCl) was used to stratify patients into four groups: Group 1 (CrCl >60ml/min), Group 2 (CrCl 60-30 ml/min), Group 3 (CrCl <30 ml/min), and Group 4 (hemodialysis). Plasma milrinone concentration was determined by liquid chromatography-mass spectrometry. Hemodynamic and arrhythmic effects were compared to a pre-milrinone baseline.

Results: All patients (76% male; 39% ischemic cardiomyopathy) had stage D HF and an implanted cardiac defibrillator (ICD). There was no difference in the mean infusion rates (0.391 + 0.08 mcg/kg/min) (p=0.14) between groups. Of 8 post-milrinone ventricular tachycardia episodes requiring defibrillation, 6 occurred in Group 4 patients.

Conclusions: Milrinone concentrations are markedly elevated in renal dysfunction. Quantification of milrinone concentrations may identify those at highest risk of ventricular arrhythmias.

	Group 1 (n=14)	Group 2 (n=10)	Group 3 (n=3)	Group 4 (n=2)
Milrinone (ng/ml)	451+ 243	591 + 293	1,575 + 962	6,252 + 4,409b
CI increasea	24% + 25%	44% + 45%	50% + 14%	15% + 35%

Data as mean + SD
a Cardiac Index
b p<0.05 vs all groups